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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/975,995
Filing Date: October 15, 2001
Appellant(s): BRADY ET AL.

Patrick C. Keane, Reg. No. 32,858
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09 May 2008 appealing from the Office action mailed 11 January 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,619,503	DENT	4-1997
5,793,253	KUMAR et al.	8-1998
4,459,651	FENTER	7-1984
5,911,117	BHAME et al.	6-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claim 1-2, 11-12, 19, 25-26, 29, 36-37, 40, 76-83, 86-88, 90-94 and 97-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,619,503 (filed 11 January 1994) (herein *Dent*) in view of US Patent 5,793,253 (filed 28 April 1995) (herein *Kumar*) and further in view of US Patent 4,459,651 (filed 1 July 1982) (herein *Fenter*).**

Claim 1 is limited to an apparatus for full duplex wireless communication of information. Concerning this claimed preamble, *Dent* likewise discloses a cellular/satellite communications system, wherein hub-to-satellite and satellite-to-hub communication takes place over in a full-duplex manner through frequency division multiplexing, where transmit and receive signals may be received on separate antennas or through a single antenna and split with a diplexing filter. *Dent* at col. 12 *l.* 55 to col. 13 *l.* 6.

The body of this claim requires 1) means for performing, 2) means for information transmission/reception, 3) regulator means and 4) means for inhibiting. Concerning the first element, this claim further requires that a) the means for performing performs at least one of modulating and demodulating information signals and that b) the

modulated information signal is boosted in power using a plurality of 90-degree hybrids arranged in tandem to output a plurality of amplification channels. *Dent* at fig.6 discloses the aforementioned hub 400 and satellite 410 used to communicate ultimately with a plurality of mobile stations 420. *Dent* at figs.7 & 8a respectively discloses the transmitter and receiver of the satellite. *Id.* at col. 4 ll. 29-32. Note that details of the transmitter's modulator bank 430, combiner, TWT 450 and antenna 460 (mislabeled as 480 in fig.7) are provided in figure 10. *Id.* at col. 11 *l.* to col. 12 *l.* 31. This modulator bank 430 corresponds to the claimed "means for performing at least one of *modulating* and demodulating information signals." The modulated signals from 430 are combined and amplified by a TWT 450 (traveling wave tube amplifier) to boost their power. Although the TWT generally corresponds to a device that boosts power of modulated information, it is evident that the TWT does not inherently comprise a "plurality of 90-degree hybrids arranged in tandem to output a plurality of amplification channels."

Concerning this deficiency of *Dent*, the prior art recognizes that TWT amplifiers have severe power limitations. *Kumar* at col. 1 ll. 31-47. In solution, *Kumar* teaches a solid state transmitter matched to a low power output oscillator and providing two-stages of power amplification. *Id.* at col. 1 ll. 61-65. The most important aspects of the *Kumar* amplifier are depicted in figs.5 & 7, where an input signal is power divided 41, provided to a plurality of power amplifiers 43A-43N and combined 45 to produce a high power output. *Id.* at col. 4 ll.47-64. As seen in fig.7, which depicts amplifiers 43A-43N, a plurality of quadrature (90-degree) hybrids 65a, 65b and 65c are arranged in tandem to produce a plurality of amplification channels labeled 69b1, 69b2, 69c1 and 69c2. *Id.* at

col. 5 ll. 50-53. Finally, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the TWT amplifiers 1003 and 1007 of Dent with the high power solid state microwave transmitter of Kumar to overcome the aforesaid known disadvantages of TWT amplifiers.

Concerning the second element, this claim further requires that the means for information transmission/reception provide a) information transmission using a first polarization and b) information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication. As mentioned above, *Dent* discloses an antenna 460 for coherent signal transmission. The antenna is described in connection with fig.10 as a dual-circular polarized horn antenna 1009. *Id.* at col. 12 ll. 24-27. Further, both the satellite and hub communicate in essentially the same manner, just using a different set of k-band frequencies. *Id.* at col. 12 ll. 55-63. This frequency division provides one form of duplex signal separation. A second form of separation/isolation just as claimed is provided in that signals are transmitted from both the hub and satellite using opposite polarities. *Id.* at col. 12 ll. 22-34, 55-63. Specifically, both left and right-handed signals are transmitted from the hub and satellite such that the left and right-handed signals crossing paths will not interact. *Id.* In this way, the dual-polarized horn antenna(e) corresponds to "means for information transmission/reception, said information transmission/reception means providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication.

The above interpretation of the claim notwithstanding, it is noted that because the statutory class of claim 1 is an "apparatus," functional limitations such as "providing for information transmission using a first polarization and for information reception using a second polarization to thereby isolate information transmission from information reception in full duplex communication" necessitate that the prior art apparatus only be capable of performing those functions. In this case, the apparatus of *Dent* clearly is capable of isolating solely on the basis of polarization in the case that beams from the satellite happen to only route through TWT 1003 (as may occur if a zero voltage signal is present on certain beams or only one beam is active), and beams from the hub happen to only route through TWT 1007. In this way, the apparatus of *Dent* is inherently capable of performing the claimed function.

Concerning the third element, this claim requires that the regulator means has at least one DC voltage regulator for providing at least two DC output voltages. *Dent* does not disclose regulating power. In fact, *Dent* does not even mention power consumption. But since power is a necessity for of the *Dent* invention to perform (i.e. it is an electrical device), it is incumbent upon one of ordinary skill in the art to select and provide a power source. For example, the regulator of *Fenter* serves to provide consumable power in a controlled manner such that power is provided with minimal circuit overhead, thereby reducing weight and size while increasing efficiency. *Fenter* at col. 2 ll. 1-16. Like this third claimed element, *Fenter* teaches providing two DC outputs, depicted in figure 2 as a +24V and a +5V output. *Id.* at col. 1 ll. 9-12, col. 4 *l.* 2. In this way, *Fenter* discloses a "regulator means having at least one DC voltage regulator for providing at

least two DC output voltages (+24V and +5V)" as claimed. Finally, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide power in the manner taught by Fenter to realize the aforesaid advantages in addition to the inherent need to provide power.

Concerning the fourth element, this claim requires that the means for inhibiting inhibits a first of the two DC voltage outputs when a second of the two DC voltage outputs is above a predetermined threshold. As noted apropos the third element *supra*, it would have been obvious to combine *Dent* with *Fenter*, to provide a two output DC voltage regulator. Moreover, in operation, the *Fenter* regulator monitors the +5V output at pin 04 of error amp 300. *Id.* at col. 8 ll. 52-66, fig.2. When the +5V output rises above a specified threshold, the error amplifier enables optical coupler 320, which prevents timer 240 from pulsing transistor 170, which effectively prevents further power from being transmitted to the secondary transfer circuits that form the +24V output. *Id.* In this way, *Fenter* discloses "means (300 and 320) for inhibiting a first (+24V) of said two DC voltage outputs when a second (+5V) of said two DC voltage outputs is above a predetermined threshold" as claimed. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 2 is limited to an apparatus according to claim 1. Figure 10 of *Dent* clearly illustrates "modulating means" comprising 'input means" that allow a video signal from each antenna element to arrive at "data processing means" 1000 and 1001, which output to power output means 1003. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 11 is limited to an apparatus according to claim 1. *Dent* discloses the use of two antennae inherently separated by a distance. One antenna is used for reception while the other is used for transmission. See column 12, lines 64-65. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 12 is limited to an apparatus according to claim 1. In alternative to the use of two antennae, *Dent* discloses the use of a single antenna. See column 12, lines 65-67. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 76 is limited to an apparatus according to claim 11. Although figure 10 illustrates direct modulation of a 20GHz VCO, *Dent* discloses modulating video signals first modulated to 2-3GHz to the greater 20GHz band. See column 12, lines 44-54. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 77 is limited to an apparatus according to claim 76. In performing the aforementioned multiple step modulation, *Dent* uses an 18GHz local oscillator signal for modulating a sideband up to 20GHz. See column 12, lines 51-54. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claims 78-83 are limited to apparatuses according to claim 76. As seen in figure 7 of *Kumar*, a plurality of parallel amplification channels are provided, namely 69b1, 69b2, 69c1 and 69c2. The plural of channels are provided in part by "coupler" 65a (claim 79). In fact, three couplers 65a, 65b and 65c are used to provide four channels with an output power ranging up to 125W (claim 80). See column 4, lines 56-59. The

channels are combined using combiners 69a, 69b and 69c (claims 81 and 83), where each is a quadrature/90-degree hybrid (claim 82). See column 5, lines 50-53. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claims 86 and 87 are limited to apparatuses according to claim 11. Figure 8b of *Dent* illustrates components of the receiver bank 340 seen in figure 8a of *Dent*. In particular, a down converter 830/"demodulating means" is provided inherently provided with input means to receive the output from component 820 and data processing means for performing down conversion/demodulation. Another down converter 440 is provided in figure 7. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claim 88 is limited to an apparatus according to claim 87. A local oscillator provides a demodulating signal to bank 440 of figure 7, units 830 of figure 8b, and, although not shown, an 18GHz signal to the transmitter of figure 10. Therefore, *Dent* in view of *Kumar* and further in view of *Fenter* makes obvious all limitations of the claim.

Claims 19, 25, 26 and 90-94 recite methods that are inherently, respectively performed by the apparatuses of claims 1, 11, 12, 76-78, 80 and 81, and are rejected for the same reasons.

Claims 29, 36, 37, 40 and 97-102 recite transceivers that are essentially, respectively the same as the apparatuses of claims 1, 11, 12, 86, 76/77, 78, 81, 80, 79 and 82, and are rejected for the same reasons.

Claims 84 and 85 are limited to apparatuses according to claim 11. Apropos the rejections of these claims presented in the Non-Final Office Action filed 15 June 2006, Dent does not disclose regulating power, or for that matter any manner concerning power consumption. As power is a necessity for any of Dent's products to perform, it is incumbent upon one of ordinary skill in the art to select some type of power feeding mechanism. As such, the regulator of *Fenter* serves to provide consumable power in a controlled manner such that power is provided with minimal circuit overhead, thereby reducing weight and size while increasing efficiency. See column 2, lines 1-16.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide power in the manner taught by *Fenter* to realize the aforesaid advantages in addition to the inherent need to provide power.

Claims 95 and 96 recite methods that are inherently, respectively performed by the apparatuses of claims 84 and 85, and are rejected for the same reasons.

Claims 103 and 104 recite transceivers that are essentially, respectively the same as the apparatuses of claims 84 and 85, and are rejected for the same reasons.

2. **Claim 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Dent* in view of *Kumar* in view of *Fenter* and further in view of US Patent 5,911,117 (filed 14 October 1997) (herein *Bhame*).**

Claim 89 is limited to an apparatus according to claim 87. Despite Applicant's failure to depict the claimed housings, it is noted that Dent fails to suggest suitable housings for the transceiver components used in both the satellite 410 and hub 400.

However, Bhame at figure 3, column 9, lines 12-17, and column 13, lines 37-43, discloses transceiver components 31 as well as radio equipment for sending and receiving radio signals. These components correspond to "modulating means and said demodulating means." Bhame further teaches that said transceiver components, and radio equipment are enclosed within housing 33, which corresponds to the "hermitically sealed housing".

It would have been obvious for one of ordinary skill in the art at the time of the invention to house the transceiver components of Dent, including the modulating and demodulating means, in the manner taught by Bhame for the purpose of providing a protective housing for the radio communication components.

(10) Response to Argument

I. The combination of *Dent*, *Kumar* and *Fenter* makes obvious all limitations of independent claims 1, 19 and 29.

Concerning the second element of claim 1, Appellant alleges that *Dent* does not disclose the information transmission/reception means. Specifically, Appellant initially alleges 1) that at a high-level *Dent* takes advantage of orthogonal polarizations to increase the number of signals transmitted at a single frequency while the claimed invention simply isolates information transmission from information reception. Appellant further alleges 2) that as disclosed in its specification, Appellant transmits one signal with one polarization and receives a signal with a different polarization. The Appellant finally alleges 3) that *Dent* requires a frequency multiplexer to combine and split apart signals while Appellant's invention does not and, thus, suffers a resulting loss

in bandwidth. Each of these allegations fails to show how the use of two polarizations and two frequencies in *Dent* does not read on Appellant's claim 1. As broadly recited, the claimed means for information transmission/reception uses in full-duplex communication a first polarization for transmission and a second polarization for reception. Similarly, *Dent* discloses using two different polarizations. Moreover, a group of signals are transmitted using one polarization while another group of signals are received using another polarization. In this way, *Dent* clearly discloses the claim language as taken in its plain meaning. Although *Dent* suggests that a single polarization may both transmit and receive, this fact does not alter the ability of the *Dent* invention to perform the same function as the claimed means. Without any language in the claim barring the ability to transmit and receive using a single polarization, *Dent* clearly anticipates this claim limitation. Finally, note that Appellant simply defines the means for information transmission/reception as an RF output. (Specification 5, 15 October 2001). The element asserted in the rejection of this claim as corresponding to the claimed means is an antenna. Since patentability of apparatus claims are ultimately determined by their structure, it is clear that the *Dent* antenna structurally anticipates a broadly disclosed RF output.

Concerning the first element of claim 1, Appellant alleges that the rejection did not address the hybrid arrangement for polarized transmission. However, the outstanding rejection of claim 1 (Final Rejection 3, 11 January 2008) refers back to an earlier rejection of claim 1 (Non-Final Rejection 11, 14 December 2006) where the hybrid

arrangement is specifically rejected as unpatentable over *Dent* in view of *Kumar*. This rejection is included in the rejection of claim 1 *supra* for ease of reference.

Concerning the third and fourth elements of claim 1, Appellant makes four allegations why *Dent* in view of *Kumar* and further in view of *Fenter* does not make obvious the claimed regulator means having at least one DC voltage regulator for providing at least two DC output voltages or the claimed means for inhibiting a first of the two DC voltage outputs when a second of the two DC voltage outputs is above a predetermined threshold. First, Appellant alleges that the cited passage of *Fenter* (col. 2 ll. 1-16) does not disclose these two elements. While technically true, Appellant overlooks the remainder of the rejection which describes the operation of *Fenter* with respect to fig.2. Moreover, Appellant ignores all disclosure found in the cited passage found at col. 8 ll. 52-66.

Second, Appellant alleges that *Fenter* does not suggest providing at least two DC output voltages. Yet, *Fenter* at figs.1 & 2 clearly depicts both a +5VDC and a +24VDC output. *Id.* at col. 4 ll. 1-2.

Third, Appellant alleges that Appellant's regulator has a DC input while *Fenter* has an AC input. However, the claimed regulator means does not specify the existence of a DC input. Moreover, *Fenter* actually discloses converting any AC input into a DC input using a rectified line power circuit 14 known to one of ordinary skill in the art for forming a DC signal from an AC signal. *Fenter* at col. 4 ll. 10-17, fig.2 (depicting a full-wave bridge rectifier cascaded with a filter capacitor in a low pass configuration where AC waves are shunted from node OP+ to node –ON). The remaining circuitry generally

shown in fig.1 as blocks 15, 20, 24 and 30 (specifically shown in fig.2) thus acts on a DC input.

Fourth, Appellant alleges that *Fenter* does not allow the +5VDC output to rise very far above +5V. The Appellant then contrasts this operation with inhibiting a second DC voltage output. In this way, Appellant simply ignores all cited disclosure of the second +24VDC output and how that output is effectively inhibited by preventing further charge from being passed to the secondary transformer powering the +24 VDC output when the +5VDC output is above the level of VREF measured by error amp 300. *Id.* at col. 8 ll. 52-66.

II. The combination of *Dent*, *Kumar*, *Fenter* and *Bhame* makes obvious all limitations of dependent claim 89.

Appellant argues that because the combination of *Dent*, *Kumar* and *Fenter* does not make obvious all limitations of claim 1 and *Bhame* fails to make up for the alleged deficiencies of that combination noted under Appellant's heading 'I', claim 89 is allowable. However, since *Dent*, *Kumar* and *Fenter* do indeed make obvious all limitations of claim 1, this allegation by Appellant is similarly unpersuasive. Accordingly, the Board should maintain the rejection of claim 89.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Walter F. Briney, III/

Examiner

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